Course Outline

Course Code	RSM 358 H1 F
Course Name	Foundations of AI for Management
Term, Year	Fall, 2024
Course Schedule	L0101 Tu 3-5 / RT 142, L0201 Fr 1-3 / WO 20
Web page URL	https://q.utoronto.ca

Instructor Details

Name	Email	Phone	Office Hours	Office Link
Ryan Webb	ryan.webb@rotman.utoronto.ca	416-978-4418	W 10-12	Rotman 568

Course Scope, Mission and Learning Outcomes

Artificial intelligence — the application of machine-learning techniques to prediction problems historically performed by humans— is transforming business and society. This course provides a hands-on introduction to the wide variety of algorithms used in applications of machine-learning. The technical topics will include linear regression models, classification algorithms, and more recent machine-learning techniques rooted in neuroscience like reinforcement learning and deep learning. Application topics will include predicting consumer choices, MLB salaries, and Super Mario Bros. There will be an emphasis on conceptual understanding, so that students can interpret the results of these techniques to support effective decision-making. The course will be complemented by many hands-on exercises using the R programming language.

Course Prerequisites

ECO220Y1/ ECO227Y1/(STA220H1, STA255H1)/(STA237H1, STA238H1)/(STA257H1, STA261H1), CSC108H1/ CSC148H1

Course Materials

Required Readings

Item	Title	Required	Instructions
Text	An Introduction to Statistical Learning (2nd Ed) By James, Witten, Hastie, Tibshirani	Yes	This will be the main text for the course. It is available in hardcopy or online here
Text	Reinforcement Learning By Sutton and Barto	No	Some material will be drawn from this textbook, but it is not mandatory reading
Reading	Prediction Machines By Agarwal, Gans, Goldfarb	No	Available online from UofT library here

Evaluation and Grades

Grades are a measure of the knowledge and skills developed by a student within individual courses. Each student will receive a grade on the basis of how well they have command of the course materials, skills and learning objectives of the course.

Work	Percentage of grade	Due Date
Class Participation/Attendance	10%	Ongoing
Assignments	30%	See Quercus
Mid-Term Test	20%	Week of Oct 7-12
Final Term Test	40%	Date to be determined

Course Format and Expectations

Writing Assignments or Presentations

All assignment will be submitted via Quercus. Students are expected to compete the assignments individually and be familiar with the University of Toronto standards of Academic Integrity (see below).

Class Participation

Students are expected to prepare thoroughly and make every effort to attend every class. As class participation is a graded component of the course, students will be evaluated on the following:

- Thoughtful responses
- Understanding and analysis of topic
- Idea generation
- Promoting further discussion

Missed Tests and Assignments (including mid-term and final-term assessments)

Students who miss a test or assignment for reasons entirely beyond their control (e.g. illness) may request special consideration **within 2 business days** of the missed midterm/test/assignment due date.

In such cases, students must:

1. Complete the Request for Special Consideration form: https://uoft.me/RSMConsideration
2. Provide documentation to support the request, eg. Absence Declaration from ACORN, medical note etc.

Please note: As of September 2023, students may use the Absence Declaration on ACORN ***one time per term*** to report an absence and request consideration. **Any subsequent absence will require a Verification of Illness form or other similar relevant documentation.**

Students who do not submit their requests and documentation within 2 days may receive a grade of 0 (zero) on the missed course deliverable.

The mark for the final exam will be re-weighted to account for the missed test or assignment.

Final Exams: If you miss the final exam in this course for a legitimate reason (illness, etc) you will need to contact your College Registrar to file a petition for a deferred exam. This deferred exam will be written at a later date as established by the Faculty of Arts & Science. Instructions can be found here: https://www.artsci.utoronto.ca/current/faculty-registrar/petitions-appeals/preparing-petition

Late Assignments

All assignments are due on the date and at the time specified in Quercus. Late submissions will normally be penalized by 25% if the assignment is not received on the specified date, at the specified time. A further penalty of 25% will be applied to each subsequent day. Students who, for reasons beyond their control, are unable to submit an assignment by its deadline must obtain approval from the instructor for an extension. Supporting documentation will be required as per the policy on missed tests and assignments.

Statement on Equity, Diversity and Inclusion

The University of Toronto is committed to equity, human rights and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect where all members of our community can express themselves, engage with each other, and respect one another's differences. U of T does not condone discrimination or harassment against any persons or communities.

Commitment to Accessibility

The University is committed to inclusivity and accessibility, and strives to provide support for, and facilitate the accommodation of, individuals with disabilities so that all may share the same level of access to opportunities and activities offered at the University.

If you require accommodations for a temporary or ongoing disability or health concern, or have any accessibility concerns about the course, the classroom or course materials, please email Accessibility Services or visit the Accessibility Services website for more information as soon as possible. Obtaining your accommodation letter may take up to several weeks, so get in touch with them as soon as possible. If you have general questions or concerns about the accessibility of this course, you are encouraged to reach out to your instructor, course coordinator, or Accessibility Services.

Academic Integrity

Academic Integrity is a fundamental value essential to the pursuit of learning and scholarship at the University of Toronto. Participating honestly, respectfully, responsibly, and fairly in this academic community ensures that the U of T degree that you earn will continue to be valued and respected as a true signifier of a student's individual work and academic achievement. As a result, the University treats cases of academic misconduct very seriously.

The University of Toronto's Code of Behaviour on Academic Matters outlines the behaviours that constitute academic misconduct, the process for addressing academic offences and the penalties that may be imposed. You are expected to be familiar with the contents of this document. Potential offences include, but are not limited to:

In papers and assignments

- Using someone else's ideas or words without appropriate acknowledgement.

- Submitting your own work in more than one course without the permission of the instructor.

- Making up sources or facts.

- Obtaining or providing unauthorized assistance on any assignment (this includes collaborating with others on assignments that are supposed to be completed individually).

On test and exams

- Using or possessing any unauthorized aid, including a cell phone.

- Looking at someone else's answers.

- Misrepresenting your identity.

- Submitting an altered test for re-grading.

Misrepresentation

- Falsifying institutional documents or grades.

- Falsifying or altering any documentation required by the University, including (but not limited to) medical notes.

All suspected cases of academic dishonesty will be investigated by the procedures outlined in the *Code of Behaviour on Academic Matters.* If you have any question about what is or is not permitted in the course, please do not hesitate to contact the course instructor. If you have any questions about appropriate research and citation methods, you are expected to seek out additional information from the instructor or other U of T or RC resources such as the RC Centre for Professional Skills, the College Writing Centres or the Academic Success Centre.

Generative AI / ChatGPT

- Students are encouraged to make use of technology, including generative artificial intelligence tools, to contribute to their understanding of course materials.
- Students may use artificial intelligence tools, including generative AI, in this course as learning aids or to help produce assignments. However, students are ultimately accountable for the work they submit.
- Students must submit, as an appendix with their assignments, any content produced by an artificial intelligence tool, and the prompt used to generate the content.
- Any content produced by an artificial intelligence tool must be cited appropriately. Many organizations that publish standard citation formats are now providing information on citing generative AI (e.g., MLA: https://style.mla.org/citing-generative-ai/).
- Students may choose to use generative artificial intelligence tools as they work through the assignments in this course; this use must be documented in an appendix for each assignment. The documentation should include what tool(s) were used, how they were used, and how the results from the AI were incorporated into the submitted work.

Email

At times, the course instructor may decide to communicate important course information by email. As such, all U of T students are required to have a valid UTmail+ email address. You are responsible for ensuring that your UTmail+ email address is set up and properly entered on ACORN. For more information visit the Information Commons Help Desk.

Forwarding your utoronto.ca email to a Gmail or other type of email account is not advisable. In some cases, messages from utoronto.ca addresses sent to Gmail accounts are filtered as junk mail, which means that important messages from your course instructor may end up in your spam or junk mail folder.

Recording Lectures

Lectures and course materials prepared by the instructor are considered by the University to be an instructor's intellectual property covered by the Canadian Copyright Act. Students wishing to record a lecture or other course material in any way are required to ask the instructor's explicit permission, and may not do so unless permission is granted. Students who have been previously granted permission to record lectures as an accommodation for a disability are excepted. This includes tape recording, filming, photographing PowerPoint slides, Quercus materials, etc.

If permission for recording is granted by the instructor (or via Accessibility Services), it is intended for the individual student's own study purposes and does not include permission to "publish" them in any way. It is forbidden for a student to publish an instructor's notes to a website or sell them in any other form without formal permission.

Weekly Schedule

Session	001	002	Topic	Readings
1	Sep 3	Sep 6	**Course Overview and Introduction**	Prediction Machines, Ch 1-2 ISL: 2.1
2	Sep 10	Sep 13	**Assessing Model Accuracy**	ISL: 2.2
3	Sep 17	Sep 20 (1pm-5pm)	**Linear Regression Review**	ISL: 3.1-3.5
4	Sep 24	Cancelled	**Classification** – Logistic Regression	ISL: 4.1-4.3
5	Oct 1	Oct 4	**Resampling** – Cross-Validation and Bootstrapping	ISL: 5
6	Oct XX	Oct XX	**MIDTERM (during week Oct 7-12)**	
7	Oct 15	Oct 18	**Model Selection** – Subset Methods	ISL: 6.1
8	Oct 22	Oct 25	**Model Selection** – Shrinkage Methods	ISL: 6.2
9	Nov 5	Nov 8	**Non-Linearities** – Polynomial Regression, Splines	ISL: 7.1 - 7.6
10	Nov 12	Nov 15	**Trees –** Pruning, Bagging, Random Forests, Boosting	ISL: 8
11	Nov 19	Nov 22	**Deep Learning**	ISL: 10.1-10.6
12	Nov 26	Nov 29	**Reinforcement Learning**	S&B: 2.1-2.5

Please note that the last day you can drop this course without academic penalty is November 4, 2022.

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Other Useful Links
- Become a volunteer note taker
- Accessibility Services Note Taking Support
- Credit / No-Credit in RSM courses
- Rotman Commerce Academic Support

URL links for print
- Book an appointment with a writing or presentation coach: http://uoft.me/writingcentres
- Writing and Presentation Coaching academic support page: https://rotmancommerce.utoronto.ca/current-students/academic-support/writing-and-presentation-coaching/
- Centre for Professional Skills Teamwork Resources page: https://rotmancommerce.utoronto.ca/teamwork-resources
- Book an appointment with a Teamwork Mentor: http://uoft.me/writingcentres
- Request for Special Consideration Form: https://rotmancommerce.utoronto.ca/current-students/forms-requests-and-appeals/forms/
- ACORN: http://www.acorn.utoronto.ca/
- Email Accessibility Services: accessibility.services@utoronto.ca
- Accessibility Services website: http://studentlife.utoronto.ca/as
- University's Plagiarism Detection Tool FAQ: https://uoft.me/pdt-faq
- The University of Toronto's Code of Behaviour on Academic Matters: http://www.governingcouncil.utoronto.ca/policies/behaveac.htm
- Information Commons Help Desk: http://help.ic.utoronto.ca/category/3/utmail.html
- Become a volunteer note taker: https://studentlife.utoronto.ca/program/volunteer-note-taking/
- Accessibility Services Note Taking Support: https://studentlife.utoronto.ca/service/note-taking-support/
- Credit / No-Credit in RSM courses: https://rotmancommerce.utoronto.ca/current-students/degree-requirements/credit-no-credit-option/
- Rotman Commerce Academic Support: https://rotmancommerce.utoronto.ca/current-students/academic-support/